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ABSTRACT

A questionnaire was designed to aid the interested professional in describing, characteristics and analyzing his game, model, or simulation, and tested on a number of Department of Defense (DOD) games. An over-riding goal for the questionnaire was to produce a categorization scheme for games in general. The different sections of the questionnaire were designed to provide information on basic purposes, use benefits, and costs; characterization and description; man-machine interaction necessary for the game, simulation or model; and an open-ended assessment of the game, simulation or model. (Author/RH)

ED 066006

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QUESTIONNAIRE --

MODELS, COMPUTER MACHINE SIMULATIONS, GAMES AND STUDIES

Martin Shubik and Garry Brewer

July 1971

P-4672

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QUESTIONNAIRE --
MODELS, COMPUTER MACHINE SIMULATIONS, GAMES AND STUDIES

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PREFACE

The purpose of this questionnaire is to aid the interested professional in describing, characterizing, and analyzing his game, model, or simulation. It is a first and, hopefully, useful step in the clarification of professional standards in the work on gaming and simulation. Furthermore, the questionnaire is designed so that it might also serve as a device for communicating and cataloging different games and simulations in a format that encourages easy interchange of information.

The questionnaire format has been adopted for three purposes. (1) In the course of our ongoing investigations we expect to use this document as a questionnaire. (2) Stress in design has been to produce a categorization scheme for the description and classification of games and simulation in general. The goals are to help establish professional standards and to explore the possibilities of developing a reasonably good classification and consistent description that covers many games of different varieties. (3) It is our belief that the compiling of a large, consistent sample of many games and simulations for the purposes of analysis, evaluation, information interchange, and the construction of professional standards is overdue. The work involved in doing so is both large and onerous. The handling of large quantities of data calls for at least partially computerized procedures. The format we are presenting here was designed with this type of data processing in mind.

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This questionnaire had as an original purpose the description and classification of games in general. Because the preponderance of all available resources for models, simulations, and games is spent by the Defense Department and its various derivates, we have redesigned and reorganized the instrument to reflect these activities better. Some questions were reworded, some were added, others were discarded. At this point in the process, separate questionnaires for computer, all machine models, and for man-machine and manual games were constructed.

These modified questionnaires were applied to ten representative DOD models, simulations, and games. Several Rand Corporation games were also sampled. This "shakedown" prompted another round of evaluation and redesign. The present version of a single questionnaire is the result. Although the emphasis on DOD is evident, we believe that a hard core of generally applicable information remains.

Questionnaire conceptualization and design is a potentially difficult undertaking. This particular questionnaire covers a complex, diverse, changing, and specialized body of knowledge and practice; consequently, the difficulties found in its construction have been formidable. For instance, even at the most primitive definitional level there is little but cloying disagreement. What is a model? What difference is there between a model and a simulation? What is a game and when is it not a model, and vice versa? Indeed the semantic game presently appears to take precedence and to substitute for the real game all too frequently. Other indicators of an unsettled but emerging professionalism abound. What this means is that construction of a questionnaire such as this is hard work; and no matter what results, it will have shortcomings, problems, and probably more than a few errors. We acknowledge the weaknesses and welcome comments, suggestions, and corrections from others concerned with gaming and simulation.

Parts I, II, and IV are designed for all types of models, games, and simulations. Manual and man-machine activities necessitated the additional questions in Part III as well. Further work is in progress in the categorization of questions more specifically aimed at the uses of gaming and simulation for teaching and for experimental purposes. We recognize that this questionnaire cannot be regarded as adequate in providing a means of analysis if the two major uses of a game or simulation are teaching or research alone.

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PURPOSES OF THE QUESTIONNAIRE

1. To give an overall quick picture of the purposes, use, benefits, and costs of DOD activities in:

   Gaming
   Simulation
   and the Use of Models

2. To provide an initial description and classification scheme for a professional catalog for games, simulations, and models for use in:

   (i) Quick professional interchange of information on the characteristics of models.

   (ii) Aid in construction and estimation of model characteristics for new model builders.

   (iii) Aid in the evaluation of previous and current activities.

INTRODUCTION

The state of the profession is such that no clear agreement on fundamental terms exists in all of the various activities using models, simulations, or games. Acknowledging this fact, we advance the following definitions to provide guides to indicate the type of work this questionnaire covers.

TERMINOLOGY

Gaming: A gaming exercise employs human beings acting as themselves or playing simulated roles in an environment which is either actual or simulated. The players may be experimental subjects or participants in an exercise being run for teaching, operational, training, planning, or other purposes. This questionnaire is designed to describe games constructed for these various purposes.

War Gaming: One of the major applications of simulation is war gaming. A war game is defined by the Department of Defense as a simulation of a military operation involving two or more opposing forces and using rules, data, and procedures designed to depict an actual or assumed real-life situation. It is primarily a technique used to study problems of military planning organization, tactics, and strategy.

A war game can be conducted to cover the entire spectrum of war, i.e., politico-military crises, general war, or limited war. The game may be based on hypothetical situations, real-world crises, or current operational plans. Some games are designed for joint operations by two or more military services, some are for use by a single service, and others may be used by individual Army field commanders or even by division or battalion commanders. The level of command at which the game is to be played, of course, influences the type of units to be represented and the scope of operations to be conducted.

There are three types of war games in common use today: the training game, the operational game, and the research game. The training game is the least complex and is designed to provide the participants with decisionmaking opportunities similar to those that may be experienced in combat. The operational game deals with current organizations, equipment, and tactics. It is more complex than the training game, uses inputs that are based on known quantities, and is used to test operational plans. The research game, which is the most complex of the three types of games, requires careful preparation to achieve maximum objectivity and usually is designed to study tactical or strategic problems in a future time frame.

A war game can be accomplished manually, can be computer-assisted, or can be wholly computerized. Manual games are played using symbols, pins, or pieces to represent forces, weapons, and targets on maps, mapboards, and terrain models. A computer-assisted game is a manual game using computerized models, which free the control group from many repetitive and time-consuming computations.

Computer games are based on predetermined procedures. All simulation of conflict is done by the computer in accordance with the detailed instructions contained in the computer program. The primary advantage of computer gaming is that the same situation can be simulated many times under differing conditions, to observe variability of results. A computer war game requires the use of a war game model (i.e., computer program), which contains all the rules, procedures, and logic required to conduct the game.

Simulation: Simulation involves the representation of a system or organism by another system or model, which is designed to have a relevant behavioral similarity with the original system. Games utilize a simulated environment or simulated roles for the players or both. In general, all games are simulations. However, it is not particularly useful to use the reverse categorization. In other words, not all simulations are usefully regarded as games. Computer simulations stimulating conflict or cooperation (such as completely computerized battle models) are usefully considered as games. Possibly, so are some logistic or resource allocation models where the single (automated or live player) team may be regarded as struggling against a statistical or strategic opponent called "Nature." The borderline is not hard and fast; however, we would expect to leave out a straight industrial production scheduling machine simulation from our category, for example.

Computer simulation is an analytical technique which involves the use of mathematical and logical models to represent the study and behavior of real-world or hypothetical events, processes, or systems over extended periods of time.

Simulation provides the means for gaining experience and for making and correcting errors without incurring the costs or risks of actual application. It offers opportunities to test theories and proposed modificiations in systems or processes; to study organizations and structures; to probe past, present, and future events; and to utilize forces that are difficult or impracticable to mobilize.

Simulation therefore is of value both as an educational device and as a means of discovering improved methods.

Simulation should be used when (1) it is either impossible or extremely costly to observe certain processes in the real world, (2) the observed system is too complex to be described by a set of mathematical equations, (3) no straightforward analytical technique exists for solution of appropriate mathematical equations, and (4) it is either impossible or very costly to obtain data for the more complicated mathematical models describing a system.

On the other hand, simulation should not be used when (1) simpler techniques exist, (2) data are inadequate, (3) objectives are not clear, (4) there are short-term deadlines, or (5) the problems are minor.

Contract Studies & Analyses: The words "studies and analyses," as used in this questionnaire, refer to those studies and analyses done by contract or by grant and which deal with the systematic and critical examinations of various subjects. Studies and analyses often require advanced analytical techniques to integrate a variety of factors and to evaluate data. Their purpose is to provide greater understanding of alternative organizations, tactics, doctrines, policies, strategies, procedures, systems, and programs.

Model: Conducting a computer or computer-assisted war game or related simulation requires the use of a computerized model. As used in this context, a model is a document or program containing all rules, methodology, techniques procedures and logic required to simulate or approximate reality. A computerized model is a computer program or series of programs, designed to simulate the logic of actions or interactions of an environment or a context and provide the results to player personnel for subsequent analysis.

MSG: To avoid the ambiguities of "local" definitional usage peculiarities, we have elected to use the shorthand version "MSG" to stand for model/simulation/game in the remainder of the questionnaire. This, we hope, will facilitate present communications in light of the still unresolved, serious definitional problems. The respondent is encouraged to substitute for himself whatever local term seems appropriate when he encounters the "MSG" label.

LABELS/ADMINISTRATION

(For Office Use Only)

1-0 INTERNAL ID TAG: (_____)

2-0 PUBLICATION ID NUMBER: (_____)
2-1 PUBLICATION ID NUMBER: (_____)
2-2 PUBLICATION ID NUMBER: (_____)
2-3 PUBLICATION ID NUMBER: (_____)
2-4 PUBLICATION ID NUMBER: (_____)

3-0 ABSTRACTED: NO
3-1 ABSTRACTED: YES
3-2 ABSTRACTED: CRITIQUE
3-3 ABSTRACTED: AUTHOR ABSTRACT

INSTRUCTIONS

In filling in this questionnaire, as many questions as possible have been designed to be answered by marking one or more relevant categories in each question (e.g., circling or marking a number). This should help to increase the speed with which the questions can be answered. Furthermore, it is easier to use computer assistance to process questions of this type. However, in many instances the words used for the categories do not quite reflect the properties of the game, simulation, or study being characterized.

The respondents are requested to mark the most relevant categories, then to make any written commentary modifying the answer or suggesting an improvement of the question.

Notes are provided on pages opposite the questions.

Use one questionnaire for each man-machine game or simulation, machine (or analogue) simulation, or study. Parts I, II, and IV of this questionnaire are designed to be answered for *all* MSGs. Part III is added to accommodate the particular characteristics of man-machine and manual games.

Note #1: Please note the amount of time taken to fill in each questionnaire and return to Question #1 to record this information upon completion of a questionnaire.

Note #2: To the right of each question there is a three-interval confidence scale. If you are certain of your answer mark an "X" at the extreme right on the scale. Please mark your confidence level for *all* questions where the scale is indicated.

Low Middle High

Confidence Level

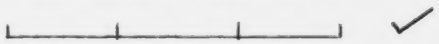
On a scale of 0-1 your answers will be interpreted as follows:

Virtually certain	.9 - 1
High	.7 - .9
Middle	.3 - .6
Low	0 - .3

If you wish you may use the scale in either of two ways, by using an X,

or by putting in a number.

"Certain" should be recorded as follows:



Models and Simulations

The word "model" is sometimes used to refer to a program that might be called a general purpose subroutine in the sense that it together with other models, may be run together in a simulation. Thus many simulations may be specific "one shot" configurations of models operated only to answer a specific question. Sometimes a large scale program may be called a simulation and is used more than once with different inputs or even with models or subroutines added. If you feel that an important technical distinction concerning your MSG has not been made, comment accordingly and note where it might influence an answer.

Builders and Users

The first section of this questionnaire is oriented more toward those who use the outputs from an MSG applied to a particular problem or study than to those who designed or built the MSG. A user who is reasonably well acquainted with the technical aspects of the work may be able to answer the second section of the questionnaire. However, if it appears necessary to have another individual or group answer the second part, this should be done and the second group should be identified.

PART I

BASIC INFORMATION ON PURPOSES, USE, BENEFITS AND COSTS

*1-0 QUESTIONNAIRE TIME (_____)

[Those Questions marked * are of particular importance and therefore extra care and accuracy are called for.]

#2. Simulation/Study/Model and Author Name Tag: This calls for the name of the first or primary effort, list name of the agency or firm (s) that built the game, simulation or model-MSG., and the name of the two or three major authors or designers.

The agency or authority is the official group ordering the work. The sponsor calls for the name of the officer or official responsible for ordering the work.

*2-0 SIMULATION/STUDY/MODEL NAME (_____)

DESIGNER BUILDING AGENCY OR FIRM (_____
_____)

AUTHOR(S) NAMES(S) (_____)

AGENCY OR AUTHORITY(IES)(_____)

(_____)

SPONSOR(S) OF WORK: NAME(S)(_____)

(_____)

*

3-0 CATEGORY: MODEL
3-1 CATEGORY: SIMULATION
3-2 CATEGORY: MAN-MACHINE GAME
3-3 CATEGORY: MANUAL GAME
3-4 CATEGORY: MATHEMATICAL ANALYSIS OR STUDY
3-5 CATEGORY: OTHER (_____) Specify

#4. Respondent's Role: [Describe your role with respect to this game or simulation, e.g., participant/player/funder/user/designer/ implementor/caretaker, etc.]

*4-0 RESPONDENT'S ROLE: FUNDER OR SPONSOR
4-1 RESPONDENT'S ROLE: USER
4-2 RESPONDENT'S ROLE: DESIGNER OR BUILDER
4-3 RESPONDENT'S ROLE: PLAYER
4-4 RESPONDENT'S ROLE: CARETAKER
4-5 RESPONDENT'S ROLE: CONTROL TEAM OR REFEREE
4-6 RESPONDENT'S ROLE: OTHER (_____) Specify

[COMMENT: Give or Attach a Brief Job Description]

5-0 LENGTH OF TIME YOU HAVE BEEN ACQUAINTED WITH THIS WORK (_____)

6-0 IF LESS THAN 3 YEARS, LIST LAST TWO ASSIGNMENTS (_____ _____)

*7-0 RESPONDENT'S INFORMATION: NAME (_____)
RANK, TITLE AND POSITION: (_____)
(_____)

SPECIAL QUALIFICATIONS AND/OR EDUCATION RELEVANT TO THIS TASK: (Describe)

*8-0 MAJOR STATED GENERAL PURPOSE OF YOUR MODEL, GAME, OR SIMULATION:

[If you were given a few minutes to describe the project to a senior official, what could you say? (This could be one to two double-spaced, typed pages, or if you have a reasonably short written summary, simply attach a copy.)]

9-0 SPECIFIC PURPOSES:

[Name two <u>specific</u> examples of questions or operational problems this MSG has been used to answer.]

[NOTE: If more than one category applies, circle more than one answer in your reply.]

#10. Purpose: This question is somewhat redundant with #8 and #9. However, here you are asked to conform to a few-word description of the work. It is important to note the distinctions made in #10-3 and #10-4. Some strategic games have introduced diplomatic considerations and international bargaining. These would fall under the category #10-3. Other simulations and gaming exercises may be explicitly concerned with internal economic and domestic repercussions. These would more appropriately be classified under #10-4. It is of course possible to have exercises that may be classified under more than one category, such as both #10-3 and #10-4.

*

10-0 PURPOSE: TECHNICAL EVALUATION
10-1 PURPOSE: DOCTRINAL EVALUATION
10-2 PURPOSE: FORCE STRUCTURE EVALUATION
10-3 PURPOSE: MILITARY-DIPLOMATIC ANALYSIS/INTERNATIONAL RELATIONS
10-4 PURPOSE: MILITARY-POLITICAL-ECONOMIC ANALYSIS/DOMESTIC RELATIONS
10-5 PURPOSE: TRAINING/EDUCATION
10-6 PURPOSE: RESEARCH METHODOLOGY
10-7 PURPOSE: OTHER (_____) Specify

Low Middle High
Confidence Level

#11. Classification: Often simulations or models per se are unclassified. However, when military planning factors are added they then become secret or may have an even higher classification. This means that for some there will be supportive documents that fall into many classifications. #11-5 Proprietary. We include business classifications, such as simulations run internally by corporations and classified as corporate confidential; furthermore, proprietary implies that the documents are made available only by the proprietor to whomever he sees fit.

11-0 CLASSIFICATION (WITHOUT INPUTS): NA; UNCLASSIFIED
11-1 CLASSIFICATION (WITHOUT INPUTS): FOUO
11-2 CLASSIFICATION (WITHOUT INPUTS): CONFIDENTIAL
11-3 CLASSIFICATION (WITHOUT INPUTS): SECRET
11-4 CLASSIFICATION (WITHOUT INPUTS): TOP SECRET
11-5 CLASSIFICATION (WITHOUT INPUTS): PROPRIETARY
11-6 CLASSIFICATION (WITHOUT INPUTS): OTHER (_____)
Specify

12-0 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): NA;UNCLASSIFIED
12-1 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): FOUO
12-2 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): CONFIDENTIAL
12-3 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): SECRET
12-4 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): TOP SECRET
12-5 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): PROPRIETARY
12-6 CLASSIFICATION (INPUT DATA, OTHER INFORMATION*): OTHER (_____
_____) Specify

*[DESCRIBE]

#13. Professional Review. What professional reviewing procedures are used to check periodically on the validity of this MSG, its use and its inputs? Is there any formal reviewing group external to both the users and producers?

*
13-0 PROFESSIONAL REVIEW:

WHO? (_____)

LAST DONE? (_____)

#14. MSG Parent or Antecedents; The first three subcategories ask for information on a formal model parent, i.e., existing model, simulation, or game that is acknowledged as the direct parent of the model categorized. Even for original models, there in general was a prior work or specific piece of literature or several models and pieces of literature which provided the suggestion or stimulation (positive or negative) for the construction of this model.

14-0 MSG PARENT OR ANTECEDENTS, DIRECT: NONE
14-1 MSG PARENT OR ANTECEDENTS, DIRECT: ONE
14-2 MSG PARENT OR ANTECEDENTS, DIRECT: MORE THAN ONE (_____
_____) Specify
14-3 MSG MODEL PARENT OR ANTECEDENTS, INDIRECT, NUMBER: (_____)

Low Middle High
Confidence Level

15-0 NAME DIRECT PARENTS (_____)
(_____)

16-0 NAME INDIRECT ANTECEDENTS:(_____)

*#17. Development Initiation Date: Give date or approximate date to nearest month or year.

*17-0 DEVELOPMENT INITIATION DATE: (_____)

*#18. Use Initiation Date: This means the first production run.

18-0 USE INITIATION DATE: (_____)

#19. MSG Spinoff. This refers to models, games or simulations for which this MSG was a parent. We also count the same MSG used elsewhere by a different agency, authority, or group in which case "same" would be entered as a name of a spinoff.

19-0 MSG SPINOFF: NONE
19-1 MSG SPINOFF: ONE OR MORE (_____) Specify number.

Low Middle High

Confidence Level

20-0 NAMES OF ONE OR TWO SPINOFFS: (_____)
(_____)

MODEL/SIMULATION/GAME PRODUCTION AND PURPOSE

#21. Funding: In some instances, especially when individuals do a fair amount of work in their "spare time," one should note more than one funding source. Multiple funding sources may also arise when a game is started at one location and completed, run, or used at another location. NSF would be classified as #21-1 and #21-9.

21-0 FUNDING SOURCE: (_____)
21-1 FUNDING SOURCE: FOUNDATION (_____)
21-2 FUNDING SOURCE: PRIVATE (BUSINESS, SELF, MISC.) (_____)
21-3 FUNDING SOURCE: ARPA (_____)
21-4 FUNDING SOURCE: JCS (_____)
21-5 FUNDING SOURCE: USA (_____)
21-6 FUNDING SOURCE: USAF (_____)
21-7 FUNDING SOURCE: USN (_____)
21-8 FUNDING SOURCE: OTHER DOD (_____)
21-9 FUNDING SOURCE: OTHER US GOVERNMENT (_____)
21-10 FUNDING SOURCE: UNIVERSITY (_____)
21-11 FUNDING SOURCE: OTHER (_____)

#22. MSG Production: #22-2 For profit includes the possibility that a game is built by a for-profit organization but not necessarily used as a product. For example, it might be used for research or for internal training purposes. The producer may be a for-profit organization building for the DOD.

22-0 MSG PRODUCTION: PRIVATE, INDIVIDUAL
22-1 MSG PRODUCTION: UNIVERSITY
22-2 MSG PRODUCTION: FOR PROFIT
22-3 MSG PRODUCTION: ARMED FORCES
22-4 MSG PRODUCTION: NOT FOR PROFIT

#23. MSG Initiation: #23-1 Model builders/researchers refers to a project where the original proposal was initiated with the individual specifically interested in researching and building the simulation. Much of MSG/research work falls under this category. The researchers propose the construction of the MSG to a funding or a sponsoring agency. #23-2 MSG/users may initiate a proposal for construction. For example, a decision may be made to run a model at an institution which has a special facility. The request is made to the constructors and when the simulation is ready, those who requested it actually participate in its operation.

#23-3 There may be a request made internally to an organization from a management group for the construction of a model to be used by other individuals in the organization. In other words, "a" requests "b" to construct a model to be used by "c." This is a fairly common managerial structure. #23-4 An agency outside of an organization which intends to use a model may request the organization to build it for the agency. For example, the local governmental group may decide to have several sessions with an urban development simulation. They may request private corporations to build it for them and may then use the model for training, operational,or advocacy purposes. #23-5 An outside agency may request a different institution to both build and use a simulation for their purposes. In this case, the sponsor is really only interested in the results and not in the specific aspects of the model. For example, in certain simulations or computerized battle models, the question posed may be "what are the characteristics of this weapon under a given set of circumstances?" The sponsor may approve having a simulation built and constructed; however, the sponsor's technical interest per se, is only limited to the results and not to its operation.

*

23-0 MSG INITIATION: NA; UNKNOWN
23-1 MSG INITIATION: MODEL BUILDERS/RESEARCHERS
23-2 MSG INITIATION: MODEL USERS INTERNAL TO ORGANIZATION
23-3 MSG INITIATION: INTERNAL TO ORGANIZATION
23-4 MSG INITIATION: USER, EXTERNAL TO ORGANIZATION
23-5 MSG INITIATION: NON-USER, EXTERNAL TO ORGANIZATION

#24. Initiator Purpose: #24-1 The differentiation we wish to make between the terms teaching and training is that training is more concerned with "how to" whereas teaching is more concerned with "why." In many instances teaching and training blend imperceptibly into each other. #24-2 Analysis. This meaning is to be distinguished from #24-5 research/theory development. Analysis means the honest grappling with a specific question or set of questions related to a given problem. The distinction is best made between operational modeling, where a purpose of analysis is fairly well known, and academic modeling,where research and theory development are more the norm.

24-0 INITIATOR PURPOSE: NA; UNKNOWN
24-1 INITIATOR PURPOSE: TEACHING/TRAINING
24-2 INITIATOR PURPOSE: ANALYSIS/DIAGNOSTICS
24-3 INITIATOR PURPOSE: OPERATIONAL
24-4 INITIATOR PURPOSE: EXPERIMENTAL
24-5 INITIATOR PURPOSE: RESEARCH/THEORY DEVELOPMENT
24-6 INITIATOR PURPOSE: POPULARIZATION, ADVOCACY
24-7 INITIATOR PURPOSE: OTHER (_____)

Low Middle High

Confidence Level

#25. Specificity of Purpose of Funding Source: The specificity of purpose of the funding source will in general depend heavily upon whether or not the funding source was also the initiator of the game project. For example, a proposal may be made to ARPA to study unconventional warfare. They will sketch out certain aspects of their proposal and more or less what they are going to do. The decision to fund this will be based upon whether or not the group appears to be competent and the work seems to be "reasonable," and a considerable amount of leeway will be left for the group's actual work. Such a situation would fall under #25-2 moderately specified or #25-3 diffusely specified. On the other hand, there may be a specific request from a government agency to test a specific piece of equipment and to use a study or simulation to report on the quality of this equipment.

25-0 SPECIFICITY OF PURPOSE OF FUNDING SOURCE: NA; UNKNOWN
25-1 SPECIFICITY OF PURPOSE OF FUNDING SOURCE: TIGHTLY SPECIFIED
25-2 SPECIFICITY OF PURPOSE OF FUNDING SOURCE: MODERATELY SPECIFIED
25-3 SPECIFICITY OF PURPOSE OF FUNDING SOURCE: DIFFUSELY SPECIFIED

Low Middle High

Confidence Level

#26. Best Alternative Procedures? Imagine that the objectives of the simulation must be achieved by a different means. It might appear that to check none and then to check something else would be mutually inconsistent. However, if the MSG is used for more than one purpose this could easily arise. For example, in a MSG used for experimentation there may be no alternative for the experiment, yet the model may also be used for teaching. In this case, lectures or case studies would be reasonable alternatives.

26-0 BEST ALTERNATIVE PROCEDURES?: NA;UNKNOWN
26-1 BEST ALTERNATIVE PROCEDURES?: NONE OR VIRTUALLY NONE
26-2 BEST ALTERNATIVE PROCEDURES?: LECTURES
26-3 BEST ALTERNATIVE PROCEDURES?: CASE STUDIES/HISTORY
26-4 BEST ALTERNATIVE PROCEDURES?: ANALYSIS
26-5 BEST ALTERNATIVE PROCEDURES?: EXPERIENCE
26-6 BEST ALTERNATIVE PROCEDURES?: GAMING

#27. Major Use of MSG: Select the appropriate categories from the list below. Also provide written commentary to explain what you mean by the categories selected, i.e., give for instances.

27-0 MAJOR USE OF MSG: NA;UNKNOWN
27-1 MAJOR USE OF MSG: TEACHING/TRAINING
27-2 MAJOR USE OF MSG: ANALYSIS/DIAGNOSTICS
27-3 MAJOR USE OF MSG: OPERATIONAL
27-4 MAJOR USE OF MSG: EXPERIMENTAL
27-5 MAJOR USE OF MSG: RESEARCH/THEORY DEVELOPMENT
27-6 MAJOR USE OF MSG: POPULARIZATION, ADVOCACY
27-7 MAJOR USE OF MSG: OTHER (_____)

Low Middle High
Confidence Level

*#28. Analysis Procedures: Explain, providing for instances, the type, amount, and rigor of analytic procedures used on the output of this MSG.

Low Middle High
Confidence Level

#29. Judged Effectiveness of Best Alternative Procedure: This is for the main purpose of the MSG. By main purpose of the MSG we mean the main use that in fact has been made of it. Initiator purpose had the possibility of alternative procedures for more than one use. In answering this question we restrict ourselves only to the major use.

29-0 JUDGED EFFECTIVENESS, BEST ALTERNATIVE PROCEDURE: (_____
_____)

Low Middle High
Confidence Level

#30. Number of Briefings: Total number to date based on this MSG.

*
30-0 NUMBER OF BRIEFINGS: UNKNOWN
30-1 NUMBER OF BRIEFINGS: (_____) Specify

#31. Level of Briefing: By level of briefing we refer to organization and organizational level and a description of the personnel level involved. For example, number and rank of generals or senior government officials present.

*
31-0 LEVEL OF BRIEFING: [Describe]

#32. Purpose of Briefing: Identify and state purpose of two most important briefings, i.e., what decisions depended on this MSG?

*32-0 PURPOSE OF BRIEFING: [Describe]

#33. Importance of MSG to Decision: What impact did MSG have on decision just noted? Describe specifically.

*
#34. Measure of Benefits: Specify what you regard as a reasonable measure of benefits and success from this MSG.

MSG PRODUCTION COSTS

#35. Direct Costs to Build: Under this category we mean actual expenditures of money earmarked for the purposes of developing this particular game, formal pay for working time, and measures attributed to the cost of the game. In many instances where there is a great amount of informal work done, the direct cost for the development of the game may be zero, although the indirect and unallocated costs may be enormous. For example, the UCLA business game was developed heavily by the use of faculty time which was not particularly assigned to game building. Many university games have this property. Many games built in-house to an institution without direct contractual assistance also have this property. Thus, the question should be construed as one of finding out when direct monies were assigned for the purpose of game construction.

35-0 DIRECT COSTS TO BUILD: (_____) Specify to nearest $10,000.

Low Middle High

Confidence Level

#36. The question concerning funding for development and building is specifically directed at the accounting question of what money has been formally assigned to the effort concerning a specific model, simulation or game. Thus it will almost always be an underestimation of cost.

36-0 DIRECT FUNDING TO BUILD: NO
36-1 DIRECT FUNDING TO BUILD: YES

37-0 AMOUNT OF FUNDING TO BUILD: (_____) Specify

Low Middle High

Confidence Level

#38. Total Costs Direct, Indirect, Imputed and Unimputed: The ranges are purposely kept relatively wide open because of the extreme difficulties in accurately judging the costs. In some cases a variance of 100% or more is to be expected. This will probably be a rather surprisingly large number if one is honest with himself. There is an obvious political problem here. Many of the unimputed costs would in the course of time have an opportunity cost of zero. Furthermore, to a great extent many of the unimputed costs are extra hours of work put in by oneself and not paid for. Hence they do not necessarily come out of anybody's budget or funding. They might be called the "Out of Hide Costs."

*
38-0 TOTAL COSTS TO BUILD, DIRECT, INDIRECT, IMPUTED, UNIMPUTED: (_____) Specify to nearest $10,000.

Low Middle High

Confidence Level

MODEL/SIMULATION/GAME OPERATING COSTS AND OPERATIONS

#39. Under costs to operate we include professional time, support time, set-up time, computer time, and experimental subject or participant time together with overhead. In many cases many of these items are provided free. As we are discussing actual expenditures, the estimates we will be asking for will be gross underestimates.

There is possibly more variability in operating costs than in building costs for some types of games. The variability comes in the way player time is counted as a cost as well as facilities' use and operator's time. For example, with many business games played at universities it would appear that the financial costs are zero, as the professorial and student time is not regarded as a direct cost and in some instances computation does not appear as a directly imputed cost and the use of facilities which would otherwise be unoccupied is deemed to be free. Any attempt to replicate that game in an environment that does not have these features may be extremely costly.

A political military exercise is usually run as an individual affair, and we should consider further replications even though they might be regarded as part of the same experiment as separate items. With educational games or time-shared experiments, costs are calculated based on individual game or subject use. For simulation the cost to operate is the cost to explore the answer to a typical question. This is relatively vague, but an upper bound would be the amount of exploration that might result in a small separate publication.

*

39-0 ANNUAL COST TO OPERATE, GROSS:

[An adequate answer to the question may require written comment. If so, please write below.]

YEAR	COST	Low Middle High Confidence Level
19____	(_____)	
19____	(_____)	
19____	(_____)	Specify for last five years.
19____	(_____)	
19____	(_____)	

#40. Cost to Operate, Single Use: What does it cost for a single use of the MSG, assuming only minor or no variations in input values? For example, name such a use and date it approximately. By use, we mean for a single study effort. (This of course may vary, but give an average estimate.)

*

40-0 COST TO OPERATE, SINGLE USE:

#41. Annual Update Costs: If the model is under continuous development, what are the annual costs of these activities, over and above "normal" operating costs?

*

41-0 ANNUAL UPDATE COSTS, TOTAL DOLLARS: (_____)
41-1 ANNUAL UPDATE COSTS, PROFESSIONAL MAN-YEARS: (_____)
41-2 ANNUAL UPDATE COSTS, PROGRAMMER MAN-YEARS:(_____)

Low Middle High

Confidence Level

#42. Operational Life Span (to date): By operational life span we mean the period starting after development is complete, beginning with the first operational use of the model to the period when it and its analysis or post-run exposition are set aside, having served their purpose.

If a model, simulation,or game that has been in more or less continuous use is still in operation, both that length of time of operation and the fact that it is still operational should be indicated.

*

42-0 OPERATIONAL LIFE SPAN (TO DATE): (_____) Specify

Low Middle High

Confidence Level

#43. Still Active?: By this we mean, "Is the MSG in its original or mildly modified form still actively being used for production runs?" We contrast this with a serious revision that has resulted in either a new name or an appellation such as Mark II, or Mod III, and so on.

*
43-0 STILL ACTIVE?: NO
43-1 STILL ACTIVE?: YES

Low Middle High

Confidence Level

*
44-0 MODEL USERS:

[Specify all agencies who directly use the MSG outputs by full name (not military abbreviations); indicate the prime user.]

*
#45. Operational Use Annual Frequency: By this we are trying to find out how many times this MSG is actually exercised or run annually.

YEAR	NUMBER OF TIMES	
19 ___	_____	
19 ___	_____	
19 ___	_____	Specify for
19 ___	_____	last five years
19 ___	_____	

46-0 EXPERIMENTAL USE: NO
46-1 EXPERIMENTAL USE: YES

#47. Experimental Example: If 46-1, i.e., "yes," give a for instance. [Describe]

#48. Experimental Purpose, Initial: Was this MSG designed originally for experimental use?

48-0 EXPERIMENTAL PURPOSE, INITIAL: NO
48-1 EXPERIMENTAL PURPOSE, INITIAL: YES

49-0 EDUCATIONAL USE: NO
49-1 EDUCATIONAL USE: YES

#50. Educational Example: If 49-1, i.e., "yes," give a for instance. [Describe]

#51. Educational Purpose, Initial: Was this MSG designed originally for educational use?

51-0 EDUCATIONAL PURPOSE, INITIAL: NO
51-1 EDUCATIONAL PURPOSE, INITIAL: YES

#52. Transferability of MSG Use: #52-0 is a model not intended for transfer. An example of such might be a classified simulation run to test for some particular parameter value and dispensed with after the runs; or a study or simulation may be extremely classified with only one user in mind. #52-1 This would be something like chess or Go where once the rules have been transmitted, one could take a piece of paper, draw the board, obtain some stones, and play. In general,a game of this variety can be transferred immediately at little or no cost. #52-2 An example of a game in this category would be a game that is not overly complex, is extremely well documented and produced, and is generally available. The games Simsoc or Whifn'proof or Summit or Democracy would all fit into this category.
52-3 Middling would cover simulation games such as the UCLA business game where the size of the program is not enormous and computer requirements are such that, at least in the United States, many institutions would have the facilities. Furthermore, the documentation is reasonably good. To get it operating, such a game would require one or two months, taking into account telephone calls, time delays in the mails, etc.
52-5 Simulations that are extremely difficult to travel are ones that depend upon specific facilities and crews of experienced individuals or that are enormous in computational size. For that matter they may not be computer games, but have become so large that they should be regarded more as institutions rather than games. Examples of such are METRO, The RAND Logistic Lab experiments, TEMPER, and the Carnegie Tech game. The reasons why these cannot travel are different; however, in each case the amount of work required to transfer the operation is enormous.

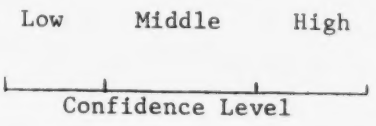
*

52-0 TRANSFERABILITY OF MSG USE: NOT INTENDED FOR TRANSFER
52-1 TRANSFERABILITY OF MSG USE: GENERALLY
52-2 TRANSFERABILITY OF MSG USE: MODERATE DIFFICULTY
52-3 TRANSFERABILITY OF MSG USE: MIDDLING DIFFICULTY
52-4 TRANSFERABILITY OF MSG USE: DIFFICULT
52-5 TRANSFERABILITY OF MSG USE: EXTREME DIFFICULTY

[Describe whether transferability just indicated pertains to any of the following situations: (1) use by another person or organization at a new site, (2) use by the same developer/designer/builder at a new site, or (3) use by another person or organization at site where MSG presently operates.]

#53. Transferability Costs to Operate: Using information provided in #52, please estimate how much additional amount, with respect to normal operating costs, would be required to transfer and then operate this MSG.

53-0 TRANSFERABILITY COST TO OPERATE: NA;UNKNOWN
53-1 TRANSFERABILITY COST TO OPERATE: COST
53-2 TRANSFERABILITY COST TO OPERATE: COST TO (COST + 10%)
53-3 TRANSFERABILITY COST TO OPERATE: (COST + 10%) TO (COST + 25%)
53-4 TRANSFERABILITY COST TO OPERATE: (COST + 25%) TO (COST + 50%)
53-5 TRANSFERABILITY COST TO OPERATE: (COST + 50%) TO (COST + 100%)
53-6 TRANSFERABILITY COST TO OPERATE: > (COST + 100%)



#54. Obsolescence: Comment on the speed at which you expect this MSG to become obsolescent indicating the reasons why. We are not referring to the need for reprogramming for new hardware or for minor modifications,but to the state where it is no longer sufficiently relevant that either a major modification has to be made or it is completely abandoned. For example, a special simulation may be built and run once for a specific purpose. A simple model may be used for many years, as long as the type of damage calculation it performs is relevant.

#55. Related MSG: Does there exist an MSG that might be regarded as serving approximately the same purpose as yours?

55-0 RELATED MSG: NO
55-1 RELATED MSG: YES

#56. Duplication of Use: If 55-1, i.e. "yes," name the MSG(S) and state why or why not one MSG could serve the purposes of all. If your answer is "no," i.e., 55-0, state why you believe there is no MSG similar to yours.

#57. Clearing House: Is there enough communication in DOD among different gaming and simulation studies or would a clearing house or central agency be of use?

*
57-0 CLEARING HOUSE: HIGHLY USEFUL
57-1 CLEARING HOUSE: USEFUL
57-2 CLEARING HOUSE: SAME AS IS
57-3 CLEARING HOUSE: HARMFUL
57-4 CLEARING HOUSE: HIGHLY HARMFUL

Comments on Question #57 are required:

#58. Standardization: After techniques and studies have been in existence for some time, standardization and exchange of common routines is extremely useful. However, sometimes premature attempts to standardize do more harm than good. In particular, redundancy to an outsider may not be redundancy to those doing a study. What is your belief in the advisability of increasing DOD gaming and simulation activity for standardization?

*

58-0 STANDARDIZATION: HIGHLY USEFUL
58-1 STANDARDIZATION: USEFUL
58-2 STANDARDIZATION: SAME AS IS
58-3 STANDARDIZATION: HARMFUL
58-4 STANDARDIZATION: HIGHLY HARMFUL

Comments on Question #58 are required:

Low Middle High

Confidence Level

#59. Regional Centers: Models, simulations, and games are operated and built at many locations using many languages and different staffs and equipment. Would, for example, 3-5 appropriately cleared regional centers for most of these activities be a more or less effective way of supporting them?

Discuss:

#60. External Review Board: Would you comment on reasons both pro and con having an external review board consider this and other MSG's built/operated/used by your organization or activity?

Discuss:

#61. External Review Board, Specification: Would you characterize a "good" external review board as to composition and function?

Discuss:

PART II

MODEL/SIMULATION/GAME CHARACTERIZATION & DESCRIPTION

NOTE:

If Part II not filled out by Office of Prime Responsibility and/or user, please indicate who filled out Part II.

Name_____

Organization_____

Relationship to
Prime Office of
Responsibility_____

#62. Scenario Type: #62-0 means that the inputs, outputs and interpretation of the outputs are all numerical (example: number of targets destroyed). #62-1 means that a verbal description of the scenario must be available prior to use (example: a man-machine or free-form game). #62-2 means that the interpretation of an output is qualitatively modified or interpreted prior to being used (example: a written assessment of qualitative aspects of target damage may accompany a computer output).

62-0 SCENARIO TYPE: ONLY NUMERICAL
62-1 SCENARIO TYPE: VERBAL DESCRIPTION NEEDED FOR USE
62-2 SCENARIO TYPE: VERBAL DESCRIPTION NEEDED FOR ANALYSIS

#63. Scenario Description: Rich "realistic" may be used to refer to a scenario which is both rich in detail and purports to be a realistic description of some phenomenon. For example, some tactical games may go to great lengths to have a realistic description of weather conditions, troop morale conditions, terrain conditions, details on buildings, and so forth. The measure of the description of environment should be relative to the real world phenomenon being modeled. For example, a business game might have fewer details in it than a diplomatic game but be a richer model in relation to actuality than the diplomatic game. Furthermore, some games may have underneath them a mathematical model which is not necessarily apparent to the users. The word "imaginative" can be used to refer to nonfactual modeling where a scenario may contain counterfactual or futuristic features. These aspects may be mixed in with other environmental categorizations.

*
63-0 SCENARIO DESCRIPTION: [Describe]

#64. Mathematical Sophistication of MSG: #64-0, None equals less than high school maths needed to interpret output or participate as a player if it is a game. #64-1, Slight equals high school maths. #64-2, Moderate equals needs college level maths (BA) or engineering degree. #64-3, High equals requires an advanced degree to interpret the output.

64-0 MATHEMATICAL SOPHISTICATION OF MSG: NONE
64-1 MATHEMATICAL SOPHISTICATION OF MSG: SLIGHT
64-2 MATHEMATICAL SOPHISTICATION OF MSG: MODERATE
64-3 MATHEMATICAL SOPHISTICATION OF MSG: HIGH

Low Middle High

Confidence Level

#65. Timing of Moves: Event timing implies that moves depend upon a specific event having occurred. Fixed clock timing implies that there is a certain increment of time upon which model activities are based. There are some models that are both event and fixed clock, in the sense that generally the clock moves forward at regular periods, e.g., descriptions of gross national product in an international model. However, simultaneously there may be moves that depend on specific events, such as conditional checking for threshold effects, time in queues, etc.

65-0 TIMING OF MOVES: NA;UNKNOWN
65-1 TIMING OF MOVES: EVENT
65-2 TIMING OF MOVES: FIXED CLOCK

#66. Model Time to Real Time Ratio: In describing the ratio of model time to real time one has the problem of distinguishing between the period assigned the real time and the amount of that time which would have been used for the decisionmaking. For example, in a model in which the real time is meant to be quarters, the price decision in a market may only take a week or two to make. In the exercise, twenty minutes may be allotted for the decisionmaking. We now have the problem of deciding whether to scale the twenty minutes against the one week or the three months. We suggest scaling against the allotted real time, i.e., the three months.

66-0 MODEL TIME TO REAL TIME RATIO: (_____) Specify

Low Middle High

Confidence Level

#67. Time Represented: In some instances where the simulator is not necessarily meant to represent any specific structure the time period represented might be interpreted as the present, but it might also be better to describe it as unspecified. In cases of doubt, it is best to note the model in both categories.

67-0 TIME REPRESENTED: PAST
67-1 TIME REPRESENTED: PRESENT
67-2 TIME REPRESENTED: FUTURE
67-3 TIME REPRESENTED: UNSPECIFIED
67-4 TIME REPRESENTED: NOT RELEVANT

#68. Level of Resolution, Model Time: This is the smallest time unit recognized by the game.

68-0 LEVEL OF RESOLUTION, MODEL TIME: NA;UNKNOWN
68-1 LEVEL OF RESOLUTION, MODEL TIME: SECONDS
68-2 LEVEL OF RESOLUTION, MODEL TIME: MINUTES
68-3 LEVEL OF RESOLUTION, MODEL TIME: HOURS
68-4 LEVEL OF RESOLUTION, MODEL TIME: DAYS
68-5 LEVEL OF RESOLUTION, MODEL TIME: WEEKS
68-6 LEVEL OF RESOLUTION, MODEL TIME: QUARTERS
68-7 LEVEL OF RESOLUTION, MODEL TIME: YEARS
68-8 LEVEL OF RESOLUTION, MODEL TIME: >YEARS

Low Middle High

Confidence Level

#69. Level of Resolution, Space: In military games, the spatial level of resolution is frequently important; in most business games spatial level of resolution is at best crude. #69-4 refers to the situation where detail may be supplied for specific locations, but no detail is given between them: for example, details of the terrain around enemy airports, but no details for terrain between them.

69-0 LEVEL OF RESOLUTION, SPACE: NA
69-1 LEVEL OF RESOLUTION, SPACE: SMALL AREAS (METERS)
69-2 LEVEL OF RESOLUTION, SPACE: MODERATE (KILOMETERS)
69-3 LEVEL OF RESOLUTION, SPACE: LARGE AREA(THEATER/CONTINENT)
69-4 LEVEL OF RESOLUTION, SPACE: VARIED

Low Middle High

Confidence Level

#70. Level of Resolution, Sides: In some models for some purposes there is no need to resolve the nature of individual teams. Gross performances of the interaction as a whole are being considered regardless of team size. For other purposes the same model may be used with considerable attention paid to the team structure.

Furthermore, a distinction between structured and unstructured groups must be made. In some instances, e.g., when studies of the emergence of leadership are being conducted, it is important that no structure be placed on the teams. In other cases the teams may be given a structure such as that of a corporation or a military command.

#70-7. As platoon, division, air force, etc., vary in size between the services, name the generic term for the unit.

70-0 LEVEL OF RESOLUTION, SIDES: NA
70-1 LEVEL OF RESOLUTION, SIDES: INDIVIDUALS
70-2 LEVEL OF RESOLUTION, SIDES: SMALL GROUPS (STRUCTURED)
70-3 LEVEL OF RESOLUTION, SIDES: ORGANIZATIONS, SMALL (FEW-100)
70-4 LEVEL OF RESOLUTION, SIDES: ORGANIZATIONS, LARGE (1000'S)
70-5 LEVEL OF RESOLUTION, SIDES: ORGANIZATIONS, VERY LARGE
70-6 LEVEL OF RESOLUTION, SIDES: SMALL GROUPS, UNSTRUCTURED
70-7 LEVEL OF RESOLUTION, SIDES: NAME UNIT (_____)

Comment:

Low Middle High

Confidence Level

#71. Level of Resolution, Military Action: The categories here are arranged in order of progressive generality, thus #71-5 includes war as a part of ongoing diplomacy.

71-0 LEVEL OF RESOLUTION, MILITARY ACTION: NA; UNKNOWN
71-1 LEVEL OF RESOLUTION, MILITARY ACTION: ENGAGEMENT
71-2 LEVEL OF RESOLUTION, MILITARY ACTION: BATTLE
71-3 LEVEL OF RESOLUTION, MILITARY ACTION: CAMPAIGN
71-4 LEVEL OF RESOLUTION, MILITARY ACTION: WAR
71-5 LEVEL OF RESOLUTION, MILITARY ACTION: DIPLOMATIC

Comment: [Note specific details of this MSG.]

Low Middle High
Confidence Level

#72. Random Events: It is possible to use a model occasionally with random events and on other occasions without random events. In this case both categories should be checked. One should not regard this question as a binary choice; both are possible.

72-0 RANDOM EVENTS: NO
72-1 RANDOM EVENTS: YES

Comment: [Note specific details of this MSG.]

CHARACTERIZATION

PLANNING FACTORS AND DATA

#73. Data Sources and Validity: Where did the data for this MSG come from? List sources in as complete a fashion as possible. Were any independent checks performed to insure the accuracy, timeliness, consistency, and overall quality of the data? Describe them.

*
73-0 DATA SOURCES AND VALIDITY: [Comments]

#74. Types of Data: It has been suggested that three types of data can be distinguished in games and simulations:

Type 1 data = High certainty data
Examples: range of a weapon under specified conditions, the size of a unit of troops, etc.
Type 2 data = Certain level of uncertainty
Examples: outcome of a company fight, radar detection range (these need parametric studies and sensitivity analysis for validation).
Type 3 data = High uncertain and hard to test
Examples: diplomatic behavior, enemy goals, broad social or economic reactions to policy.

*
74-0 TYPES OF DATA
[In terms of the three types of data requirements describe the data needed for your game or simulation.]

#75. Number of Inputs (Constants, Parameters, and Variables) in MSG: This may vary from use to use; therefore, if necessary, give lower bound, average, and upper bound.

75-0 NUMBER OF INPUT CONSTANTS: (_____) Specify
75-1 NUMBER OF INPUT PARAMETERS: (_____) Specify
75-2 NUMBER OF INPUT VARIABLES: (_____) Specify

Low Middle High

Comment:

Confidence Level

#76. Number of Output Variables in MSG: This may vary from use to use; therefore, if necessary, give lower bound, average, and upper bound.

76-0 NUMBER OF OUTPUT VARIABLES: (_____)

Specify

Low Middle High

Confidence Level

Comment:

#77. Intangibles: Are sometimes ruled out by limiting the scope of the study; by obtaining rulings from higher authority as to how they are to be treated; by using expert estimates; by using high and low bounding procedures or by other methods.

*
77-0 INTANGIBLES
[Describe how intangibles are treated in this MSG. In answering give a for instance.]

#78. Sensitivity Analysis: Discuss the importance of sensitivity analysis for this MSG and describe how it is done, if it is done at all. We are not interested in sensitivity analysis done as a routine matter of debugging; rather, what has been done since the MSG has been operational?

78-0 SENSITIVITY ANALYSIS:

Comment:

*
79-0 DATA COLLECTION TIME: (_____)
[Estimate (in man-years) data collection time required.]

Low Middle High
Confidence Level

#80. Data Validation: Frequently all data come from another agency or source with no checks from the user groups. Sometimes a user group obtains its information first hand by measurement, observation, field tests, etc. Describe how you get your data inputs and what independent checks or procedures you perform to challenge the validity of the data.

*
80-0 DATA VALIDATION:

MODEL OPERATION

SUPPORTING FACILITIES

#81. Computer Used for Running a Simulation: We mean the different computers for which this model has been run. In some cases there may be only one, and in other cases many modifications may have been issued for different machines. List not more than the three most frequently used operating systems.

81-0 COMPUTER USED FOR RUNNING: NA
81-1 COMPUTER(S) USED FOR RUNNING: THREE OR LESS (_____
_____)Specify

Low Middle High
Confidence Level

#82. Program Language: This calls for the language in which the simulation has been programmed. Frequently there may be a series of languages. All should be noted.

82-0 PROGRAM LANGUAGE: NA
82-1 PROGRAM LANGUAGE (S): (_____) Specify

Low Middle High
Confidence Level

#83. Program Size: Approximately how many instructions are there in the language(s) noted above?

83-0 PROGRAM SIZE: (_____) Specify
83-1 PROGRAM SIZE: (_____) Specify

#84. Facilities: #84-4 This refers to the situation where a special system set of languages or program may have been written to accompany the running and general handling of a specific model. For example, some models depend upon the availability of much of the specialized extra hardware and software. Although it is possible that the models themselves can travel, much of their power is lost when the accompanying personnel and equipment are not available.

84-0 FACILITIES: NA; UNKNOWN
84-1 FACILITIES: SPECIAL BUILDING OR INSTITUTION
84-2 FACILITIES: DEDICATED COMPUTER (UNCLASSIFIED)
84-3 FACILITIES: DEDICATED COMPUTER/CLASSIFIED TAPES
84-4 FACILITIES: SPECIAL LANGUAGE, LIBRARY OR COMPUTATIONAL SYSTEM

Low Middle High

Confidence Level

SIMULATION/STUDY/MODEL PRODUCTION

COSTS

General caveat on building costs. The possibilities for obtaining close cost estimates for many MSG's are difficult in the extreme. This is not merely a problem of gathering information; it is a problem of correct conceptualization of the costs that should be included to certain forms of work. In particular, joint costs play an enormously important role, thus it is not an easy matter to impute costs items such as computer time, use of joint educational facilities, and so forth to the costs. In this coding scheme we wish to stress that the costing figures presented should be used with extreme caution.

#85. Development Time is a concept about which it is difficult to be both precise and accurate. For our purposes, we must emphasize that the categories indicated are crude in the extreme. We are trying to indicate the elapsed time between the decision to build a particular model and the first production run of that model. In many cases after a model has been used once, development goes on for many years. Thus our criterion may be regarded as presenting a gross underestimation of development time. Furthermore, additional complications appear on occasion as a model develops and it may change its name. A further clarification of this idea, according to our meaning, is the time from the inception of the work on construction until the first production run . . . this is contrasted with a debugging run: they are not the same. We specifically do not consider further modification after the first production run has taken place, even though *ex post facto*, the first production run is then regarded as "experimental."

*

85-0 DEVELOPMENT TIME: (_____) Specify in years or months.

Low Middle High

Confidence Level

#86. We contrast total man-years with professional man-years. Under category #86 we include graduate students, secretarial help, programming assistance and any other forms of voluntary contribution of time. These are direct man-years and do not include allocation of institutional administrative overhead.

*

86-0 DEVELOPMENT TIME: TOTAL MAN-YEARS: (_____) Specify

Low Middle High

Confidence Level

#87. Professional man-years used in the development of a model. Under this category we include both professional designers and consultants. In many cases there are also graduate students, additional helpers, ordinary programming assistance, as well as an enormous amount of office staff.

87-0 DEVELOPMENT TIME: PROFESSIONAL MAN-YEARS: (_____)

Specify

#88. Development Team Professional Profile: Describe the professional makeup of the development team (including consultants).

*

88-0 DEVELOPMENT TEAM PROFESSIONAL PROFILE:

Describe:

Low Middle High

Confidence Level

89-0 DEVELOPMENT TIME: PROGRAMMER MAN-YEARS: (_____)

Specify

MODEL CHARACTERIZATION

DOCUMENTATION

#90. Documentation: #90-1 Excellent means that the documentation is sufficiently good that it can be picked up elsewhere by a different group of people and operated with none or a minimum of long distance telephone calls and conferences. #90-3 Average means that the documentation exists in some form but it is moderately hard to operate without at least some discussions with the originators of the document. #90-6 Uneven/highly variable is put in to characterize simulation in which there is spotty documentation often indicating an evolution of different programmers and different groups working on the model. To get decent documentation one may have to search among the disarray of documents that are presented.

*

90-0	DOCUMENTATION, EXTENT:	NA; ZERO; UNKNOWN
90-1	DOCUMENTATION, EXTENT:	EXCELLENT
90-2	DOCUMENTATION, EXTENT:	VERY GOOD
90-3	DOCUMENTATION, EXTENT:	AVERAGE
90-4	DOCUMENTATION, EXTENT:	WEAK
90-5	DOCUMENTATION, EXTENT:	POOR
90-6	DOCUMENTATION, EXTENT:	UNEVEN/HIGHLY VARIABLE
90-7	DOCUMENTATION, EXTENT:	UNAVAILABLE

#91. Documentation Availability/Location: 91-5. Proprietary (classified)/ write author. What we mean here is that the information on the simulation is classified in the sense of top secret, secret, and so on. To obtain this information, it is necessary to write the author. This relieves the burden of identifying the document and approving of its transmittal to the author and to the people who are searching for the document. Problems of clearance, need to know, and so on can then be resolved between the two interested parties.

91-0	DOCUMENTATION, AVAILABILITY/LOCATION:	NA;UNKNOWN
91-1	DOCUMENTATION, AVAILABILITY/LOCATION:	OUT OF PRINT/UNKNOWN
91-2	DOCUMENTATION, AVAILABILITY/LOCATION:	PROPRIETARY/NOT FOR PROFITS
91-3	DOCUMENTATION, AVAILABILITY/LOCATION:	PROPRIETARY/COMMERCIAL
91-4	DOCUMENTATION, AVAILABILITY/LOCATION:	PROPRIETARY/WRITE AUTHOR
91-5	DOCUMENTATION, AVAILABILITY/LOCATION:	PROPRIETARY (CLASSIFIED)/ WRITE AUTHOR
91-6	DOCUMENTATION, AVAILABILITY/LOCATION:	PUBLIC/DEFENSE DOCUMENTATION CENTER
91-7	DOCUMENTATION, AVAILABILITY/LOCATION:	PUBLIC/LIBRARY OF CONGRESS
91-8	DOCUMENTATION, AVAILABILITY/LOCATION:	PUBLIC/PROFESSIONAL JOURNALS, BOOKS

*
92-0 DOCUMENTATION: GENERAL OVERVIEW
[Describe the documentation in your own words in the remaining space.]

#93. Publication Type: #93-3. Reports/analyses, etc. This refers to publications, possibly generated after a series of runs, to be used as an official document, as a report to a higher authority, or possibly as even a supporting argument for a request for funds. This is in distinction to a document which is a book or article for nonspecific purposes.

93-0 PUBLICATION TYPE: BOOKS OR ARTICLES
93-1 PUBLICATION TYPE: USER MANUALS
93-2 PUBLICATION TYPE: PROGRAM DECKS/LISTINGS
93-3 PUBLICATION TYPE: REPORTS/ANALYSES, ETC.

*

94-0 PUBLICATION OR DOCUMENT IDENTIFICATION:

[Specify one or two documents most relevant to this game simulation or study. Give full references so that documentation may be assembled.]

TECHNICAL COORDINATION & STANDARDS

#95. Technical Coordination: One might have a central clearing house which performs a clerical operation with no professional or evaluative role. One might otherwise have a staff of several permanent professionals whose task is to compose and to technically describe the inventory of models, simulation, or games. In your opinion, supposing that a central clearing house exists should it have a technical staff?

95-0 TECHNICAL COORDINATION: HIGHLY DESIRABLE
95-1 TECHNICAL COORDINATION: UNDESIRABLE
95-2 TECHNICAL COORDINATION: INDIFFERENT
95-3 TECHNICAL COORDINATION: DESIRABLE
95-4 TECHNICAL COORDINATION: HIGHLY DESIRABLE

Discuss:

#96. Standards Committee: Question 58 asked about the desirability of standardization without specifying what. Is it premature to try to form a professional standards committee for models, games, and simulations. Is it needed? Would it probably do good or harm? Please Comment.

QUESTIONNAIRE EVALUATION

97-0 RESPONDENT'S EVALUATION OF QUESTIONNAIRE: EXCELLENT
97-1 RESPONDENT'S EVALUATION OF QUESTIONNAIRE: GOOD
97-2 RESPONDENT'S EVALUATION OF QUESTIONNAIRE: MODAL
97-3 RESPONDENT'S EVALUATION OF QUESTIONNAIRE: POOR
97-4 RESPONDENT'S EVALUATION OF QUESTIONNAIRE: BAD

[WRITTEN COMMENT ON THIS QUESTIONNAIRE IS WELCOMED:]

PART III

QUESTIONS PERTAINING TO MAN-MACHINE GAMES OR SIMULATIONS AND MANUAL GAMES

CHARACTERIZATION GENERAL DESCRIPTION

#98. Control Team: By the phrase control team we mean a formal team as part of the game making up rules or interacting with the other teams as the game progresses (#98-3). This should be contrasted with game management control(#98-2) where the directors or the managers or referees do not play a direct, important, game-influencing role. For example, most business games under this categorization do not have a control team. Few two-sided dueling games have control teams. Almost all political-military exercises have control teams.

98-0 CONTROL TEAM:UNKNOWN
98-1 CONTROL TEAM:NO
98-2 CONTROL TEAM:YES, BUT COULD BE COMPUTERIZED
98-3 CONTROL TEAM:YES, MUST BE USED

Low Middle High

Confidence Level

#99. Number of Live Player Teams: This excludes a control team. If the game has been designed to have a variable number of teams, this should be noted. The number of live teams actually used in different runs should also be indicated.

99-0 NUMBER OF LIVE PLAYER TEAMS: (_____) Specify

#100. Number of Robots: The same observations hold for robots or completely computerized teams. In simulations where a combat system is being simulated, such as in a totally computerized duel, we may regard the model as having two robots, one for each side playing the other. A simple test for this classification would be to ask how to convert this game into a man-machine game. In order to do so, some of the automated decisionmaking of one or both sides would be removed and replaced by live player decisions

100-0 NUMBER OF ROBOT TEAMS: (_____) Specify

#101. Sequencing of Moves: There are some games (such as many of the war games) played where moves are simultaneous. Furthermore, many games, such as two-person matrix experiments, usually utilize simultaneous moves. There are other games in which the moves are in fixed sequential order; examples of such are chess or checkers. There are other games in which the moves are in variable order where frequently either chance will determine the next move or a player is in a position to give the move to another player. Craps is an example of just such a game; depending on how one defines chess, one pauses to see who selects sides at the beginning in the first move in an invariable order after which it is in fixed sequential order. Another set of examples are sporting events. In baseball the batting order is fixed. In football, the interteam play goes in no particular order although a series of downs is in fixed format.

In some games some of the moves may be simultaneous whereas others may be in variable order. For example, in some strategic war games it may be required to pay costs for force maintenance every period. However, when new weapons sytems investment considerations are included, it is up to the individual team to decide whether or not they intend to invest.

101-0 SEQUENCING OF MOVES: UNKNOWN
101-1 SEQUENCING OF MOVES: SIMULTANEOUS
101-2 SEQUENCING OF MOVES: FIXED SEQUENTIAL
101-3 SEQUENCING OF MOVES: VARIABLE ORDER

Low Middle High
Confidence Level

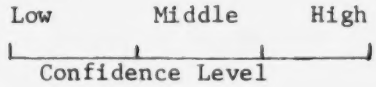
#102. Moves per Team: In this case, for complex games, we are referring to a move by the team as a whole, not to the many individual small transactions that might be taking place.

There are some games, such as damage exchange rate and attrition evaluation games or continuous search games, in which the simulation or the computation is basically a mathematical procedure with no clear definition of move. In this instance we classify the move description 102-0.

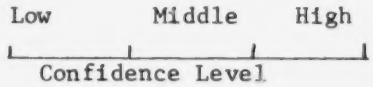
102-0 MOVES PER TEAM: NA;UNKNOWN
102-1 MOVES PER TEAM: MOVES PER TEAM (_____) Specify

#103. Complementary Procedures: #103-2 we include lectures; #103-4 we include mathematical solutions such as game theoretic solutions; and #103-6 we note field exercises.

103-0 COMPLEMENTARY PROCEDURES: NA;UNKNOWN
103-1 COMPLEMENTARY PROCEDURES: NONE
103-2 COMPLEMENTARY PROCEDURES: LECTURES
103-3 COMPLEMENTARY PROCEDURES: CASE STUDIES/HISTORY
103-4 COMPLEMENTARY PROCEDURES: SIMULATION/ANALYSIS
103-5 COMPLEMENTARY PROCEDURES: "EXPERIENCE"
103-6 COMPLEMENTARY PROCEDURES: FIELD EXERCISE



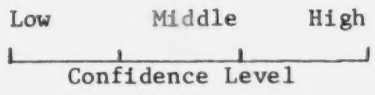
104-0 FORMAL GAME TYPE: NA;UNKNOWN
104-1 FORMAL GAME TYPE: UNDEFINED, PAYOFFS NOT SPECIFIED
104-2 FORMAL GAME TYPE: CONSTANT SUM GAME
104-3 FORMAL GAME TYPE: NON-CONSTANT SUM GAME
104-4 FORMAL GAME TYPE: ONE-PERSON MODEL (MAXIMIZATION)



#105. Rules: #105-1 Rigid manual. An example of a rigid manual game would be chess. All of the rules are well specified in advance and the game is a manual game. #105-2 Semi-rigid manual. An example would be a war game where, although the fire power and other planning factors are supplied, there may be some questions during the game that are addressed to a referring board and certain rules or rulings are made during the course of play. #105-3 Free-form or referee's direction would be a game such as a political military exercise in which the control teams and the referee's direction are critical to conducting the game. The melding of the moves and adjudication of attempted moves is a critical feature of such a game. #105-4 Rigid computerized rules are distinguished from rigid manual inasmuch as in general the rules of manual games are much more visible and hence much more open to questioning than are those of computerized games. One of the major dangers of using computerized games is that a great amount of bad modeling and theorizing can be hidden in computer programs. #105-5 Semi-rigid rules computerized. In this case the game may be computerized, but not all of the rules are necessarily described. For example, one might have a business or marketing game in which although virtually everything to do with sales, manufacturing, and internal running of the firm has been computerized, press releases and newspapers are issued to the firm, thus adding a verbal and somewhat less formalized component to the game. #105-6 In some instances games or simulations are nothing more than the dynamics of the behavior of a formal mathematical model or computer program. The category also includes rules that are well defined in a game theoretic sense.

In some games, although all rules are given they are so complicated that no single individual will know all of them (#105-7). In other games part of the purpose is to discover unstated rules (#105-8). In free-form games, there may be considerable uncertainty concerning basic structure (#105-9).

105-0 RULES: NA;UNKNOWN
105-1 RULES: RIGID MANUAL
105-2 RULES: SEMI-RIGID MANUAL
105-3 RULES: FREE FORM/REFEREE'S DIRECTION
105-4 RULES: RIGID COMPUTERIZED
105-5 RULES: SEMI-RIGID COMPUTERIZED
105-6 RULES: PROGRAM OR FORMAL MATH MODEL
105-7 RULES: WELL DEFINED BUT TOO LARGE FOR COMPREHENSION
105-8 RULES: SOME RULES, NOT KNOWN
105-9 RULES: UNCERTAINTY CONCERNING BASIC STRUCTURE



#106. Structure of Game: In the category structure of games we include, under #106-3 matrix game, a game which could conceivably be approximated by a matrix even though in some cases the strategies may be continuous. For example, it may be permitted to have a player pick any price he wants in the range from $0 - $100, but in general he may be limited to bids in units of a dollar. Even if he wanted to make it a continuous game, it is quite possible that the machine would round it off by a finite approximation and thereby make it a matrix game.

Some games may fit into more than one category. For example, a business game may have a formal structure such as an iterated matrix game; however, it begins play with a scenario describing the state of the market. #106-2 Explicit mathematical 2 x 2 matrix games. #106-3 Other matrix game. Here we are referring to a purely abstract mathematical structure provided as the venue for the game. #106-4 Implicit computerized damage exchange calculation which in fact can be regarded as a computation on an enormously large matrix. #106-5 Iterated matrix game. In many instances, such as many plays with the Prisoner's Dilemma, the game is played in a dynamic mode. However, a great amount of the decisionmaking is performed on the same structure period after period. Many business games have the same "battlefield" of a more or less similar market each period. #106-6 Free form extensive. Games like political military exercises would fall in this category. They are played move by move, but they are not necessarily repeating the same situation on each move. #106-7 Formal extensive. A game such as chess is played in formal extensive manner. The rules are rigid and well-defined; however, the players move play by play and do not enunciate overall strategies for this game. The remaining two categories concern games in characteristic function form or games in which the prime area of investigation is coalitions. #106-8 Free form characteristic function. Such a game would be one devoted to studying the coalition possibilities for a treaty on the use of the Danube, as just one example. #106-9 Formal characteristics function form. There have been experiments done using games specified in characteristic function form where the experimenter studies how the players divide the money they receive from cooperative acts.

Question #106 calls for some familiarity with several concepts of game theory. If you are not sufficiently familiar with the terms to answer, check #106-11 and proceed to the next question.

106-0 STRUCTURE OF GAME: UNKNOWN/NA
106-1 STRUCTURE OF GAME: SCENARIO/VERBAL DESCRIPTION
106-2 STRUCTURE OF GAME: 2 X 2 MATRIX
106-3 STRUCTURE OF GAME: OTHER MATRIX
106-4 STRUCTURE OF GAME: IMPLICIT MATRIX
106-5 STRUCTURE OF GAME: ITERATED MATRIX
106-6 STRUCTURE OF GAME: "FREE FORM EXTENSIVE"
106-7 STRUCTURE OF GAME: FORMAL EXTENSIVE
106-8 STRUCTURE OF GAME: "FREE FORM" CHARACTERISTIC
106-9 STRUCTURE OF GAME: FORMAL CHARACTERISTIC FUNCTION
106-10 STRUCTURE OF GAME: PURE MATH MODEL: SIMULATED OR ANALYZED
106-11 STRUCTURE OF GAME: QUESTION NOT CLEAR

Low Middle High
Confidence Level

#107. Information State: #107-1 and #107-2. The first refers to perfect information in the game theoretic sense: all players know all that can be known at all times. An example of a game with perfect information is a chess game. Incomplete information is the situation that prevails in a poker game. The kibitzers or a referee may know what the hands of all the players look like, but the players do not know each other's hands. #107-5 Considerable structural uncertainty refers to games in which the rules and the general environment are by no means clear at the beginning of the game. An example would be an extremely free form political game to be played in a future time period with the skimpiest of scenarios available. #107-3, #107-6 In some games that are designed to teach procedures and approaches to a problem, it is worth distinguishing information states in which information can be bought as contrasted with those in which calculation can be bought. For example, in a business game one may have information concerning the reaction of the market to various arrays of prices. On the other hand, one may not have procedures for fitting models to this information. The procedures such as least square statistical packages can be regarded as calculation packages. In some cases these may be available to players from "consultants" who charge for their use.

107-0 INFORMATION STATE: NA; UNKNOWN
107-1 INFORMATION STATE: PERFECT
107-2 INFORMATION STATE: INCOMPLETE
107-3 INFORMATION STATE: INFORMATION CAN BE BOUGHT
107-4 INFORMATION STATE: SOME RULES NOT KNOWN/MIXED
107-5 INFORMATION STATE: CONSIDERABLE STRUCTURAL UNCERTAINTY
107-6 INFORMATION STATE: CALCULATION CAN BE BOUGHT

Low Middle High

Confidence Level

#108. Computer Use: Under #108-1 bookkeeping/light staff work, we include the use of the computer for somewhat more than straight bookkeeping, but somewhat less than one might wish to describe as heavy analysis. #108-6 Man-machine on-line interrogative mode. We distinguish this from man-machine interactive in the sense that interactive merely implies that the machine does the computations on the environment, whereas interrogative implies that in the process of calculating, the machine questions the player and obtains answers from the player.

108-0 COMPUTER USE: NONE/BOARD/FIELD, ETC.
108-1 COMPUTER USE: BOOKKEEPING/LIGHT STAFF WORK
108-2 COMPUTER USE: ANALYTICAL AID TO PLAY
108-3 COMPUTER USE: ANALYTICAL AID DEBRIEFING/POST GAME ANALYSIS
108-4 COMPUTER USE: ANALOGUE
108-5 COMPUTER USE: MAN-MACHINE INTERACTIVE
108-6 COMPUTER USE: MAN-MACHINE ON-LINE (INTERROGATIVE MODE)
108-7 COMPUTER USE: OTHER (_____) Specify

Low Middle High

Confidence Level

#109 Gaming Facilities: #109-7 This refers to the situation where a special system set of languages or program may have been written to accompany the running and general handling of a specific game. For example, some games run at the labs at Berkeley and some games run with the TRACE system at SDC or at UCLA depend upon the availability of much of the specialized extra hardware and software. Although it is possible that the games themselves can travel, much of their power is lost when the accompanying programs and equipment are not available.

109-0 GAMING FACILITIES: NA; UNKNOWN
109-1 GAMING FACILITIES: SPECIAL BUILDING OR INSTITUTION
109-2 GAMING FACILITIES: SPECIAL LAB
109-3 GAMING FACILITIES: DEDICATED COMPUTER
109-4 GAMING FACILITIES: RENTED LAB
109-5 GAMING FACILITIES: RENTED "SPACE"
109-6 GAMING FACILITIES: TEMPORARY "FREE SPACE"; INFORMAL
109-7 GAMING FACILITIES: SPECIAL LANGUAGE, LIBRARY OR COMPUTATIONAL SYSTEM

Low Middle High
Confidence Level

GAME OPERATION TIME FRAME

110-0 SET UP TIME (_____) Specify

#111. Elapsed time of run, start to finish: We refer to the playing time of a single game or, in the case of experimental games, of a single experiment which could involve several replications; for example, when a series of experiments is run sequentially over several days. In some instances the nature of the game and its format make this figure quite precise. In other cases there is a variability of several orders of magnitude concerning how long the game takes to play. For example, some business games are run on the basis of one decision a day or one decision a week that is made in less than an hour; otherwise, the individuals carry on their normal routines.

Under this category we refer to total time lapsed from the start of the game to the debriefing. In some informal instances, such as running a game with a class, one may run the game for the whole of a semester. For example, the Carnegie Tech game may run for a period of seven or eight months. The games of the Studies, Analysis and Gaming Agency are frequently run in two different modes; One is a 3-1/2 day intensive game, and the other stretches over several weeks. In the case of experimental games, games are often run in parallel -- possibly intensively during one evening for the whole of a game, but in some cases batches of games are run comprising an experiment. In other cases players may run for more than one day. If a game is run on more than one mode, the different elapsed times should be indicated.

111-0 ELAPSED TIME OF RUN, START TO FINISH: (_____) Specify

Low Middle High
Confidence Level

#112. Player Game Play Time: By this we mean the amount of time spent in actually playing a game. This includes briefing, decisionmaking, and debriefing associated with the game.

112-0 PLAYER GAME PLAY TIME: NA;UNKNOWN
112-1 PLAYER GAME PLAY TIME: <3 HOURS
112-2 PLAYER GAME PLAY TIME: >3-6 HOURS
112-3 PLAYER GAME PLAY TIME: >6-12 HOURS
112-4 PLAYER GAME PLAY TIME: >12-24 HOURS
112-5 PLAYER GAME PLAY TIME: >1-7 DAYS
112-6 PLAYER GAME PLAY TIME: >1 WEEK (_____) [Specify]

Low Middle High

Confidence Level

#113. Formal Game Prebriefing Procedure: We note that the military use the word "indoctrination" when describing materials sent out prior to the formal briefing time in a game.

The distinction to be made here concerns whether or not a game has a formal prebriefing procedure or whether the prebriefing is informal or nonexistent. For example, chess players in general need no prebriefing if they already know the rules. Some simple games such as experiments with 2x2 matrix games, may be run with an informal briefing from the experimenter who has either decided to dispense with formal control or has overlooked the use of formal control in the verbal description of the game.

113-0 FORMAL GAME PREBRIEFING PROCEDURE: NA;UNKNOWN
113-1 FORMAL GAME PREBRIEFING PROCEDURE: NO
113-2 FORMAL GAME PREBRIEFING PROCEDURE: YES

Low Middle High

Confidence Level

#114. Formal Briefing Time (%): This can be described as a percentage of player game play time. For example, if it takes a player ten hours to play a game and there is a briefing session of 1/2 an hour, this means that briefing time is five percent of game play time.

114-0 FORMAL BRIEFING TIME (%): (_____) [Specify]

Low Middle High

Confidence Level

#115. Debriefing Time: This is also stated as a percentage of game play time for the player. In general, many experimental games, and certainly games for entertainment, have little if any debriefing. Occasionally there are post mortems after chess. Operational games and games for teaching and training may have considerable debriefing. For operational use, the length of debriefing is fairly clear; for example, after a SAGA game, there may be a half day set aside (beyond the three days of play) specifically for discussion and formal debriefing. However, with a game used for teaching purposes, such as the Carnegie Tech game, one might regard the complete course taken with the game as a briefing-debriefing session; in which case, one could claim that the debriefing and briefing time could easily be as large if not larger than the game-playing time.

If a game is used for different purposes one should indicate the briefing and debriefing time of each. The context of purposes stated in the earlier question should make clear the specific category to which a game belongs.

115-0 DEBRIEFING TIME (%): >25 (_____) [Specify]

Low Middle High

Confidence Level

#116. Control Time, Total Expenditure: This includes briefing time, running time, and debriefing time of the control group. For example, in a SAGA exercise, there may be field trips and so forth before the games scenario can be written. This type of work would be classified under game construction. The time we are interested in here is that amount spent by the individuals composing the control team for running purposes. If it is necessary for members of the control team to be briefed or indoctrinated for several weeks in advance, this would be counted as part of control time. If, however, as is usually the case, they join the group merely a day or two or even less before play time, we would start to count control team time from this point. In some instances there is not a formal control team; however, there is nevertheless a game director -- formal or informal -- whose time is being used to supervise the process. This should also be counted even though this will generally amount to no more than a few hours or a few days.

116-0 CONTROL TIME, TOTAL EXPENDITURE: MAN WEEKS (_____)
[Specify]

Low Middle High

Confidence Level

#117. Post Debriefing Analysis (Intensity): This refers to the analysis of the game run after the game is over; the debriefing may have taken place. In other words, this should not be confused with debriefing. It refers to the analysis which may be done by researchers, possibly the players in a different mode, or others to determine what has been learned from the game. In the case of experiments, this is quite obviously where much of the work is concentrated. In the case of operational games, this is where much of the work should be concentrated if one wishes to measure the effectiveness of the exercise. #117-0 Post debriefing analysis. For straight simulations there is no debriefing, hence this category is not applicable. At the same time simulations invariably involve analysis after they are run; this is picked up in #118. Under #117-4 Considerable, would be where the analysis time may be even more than the game-playing time.

117-0 POST DEBRIEFING ANALYSIS (INTENSITY): NA;UNKNOWN
117-1 POST DEBRIEFING ANALYSIS (INTENSITY): NONE
117-2 POST DEBRIEFING ANALYSIS (INTENSITY): SLIGHT
117-3 POST DEBRIEFING ANALYSIS (INTENSITY): MODERATE
117-4 POST DEBRIEFING ANALYSIS (INTENSITY): CONSIDERABLE

Low Middle High

Confidence Level

#118. Analysis Time: Answer this question in terms of man-weeks, or the percentage of actual time spent by individuals involved in the analysis as compared with total game play time. There may be an enormous amount of automated analysis going on with a small expenditure of human time. This question is concerned with the human time.

118-0 ANALYSIS TIME: (_____) [Specify]

119-0 SET UP COSTS AS % OF TOTAL COSTS TO OPERATE: (_____)
[Specify]

Low Middle High

Confidence Level

#120. Cost to Operate at New Location: Except for going to the new location we assume that all other costs will allocate in the same way. In other words, if one is calculating on free secretarial help at one place, one calculates some free secretarial help at the other place.

It makes a great difference whether or not you can bring in an operating crew. However this means that cost to operate should be looked at as the minimum cost to bring in an operating crew or cost to train new people on location. If no crew is available, it may be either impossible to transfer the game or inordinately expensive.

When we refer to new location we assume that the new location has hardware that is suited for the game involved.

120-0 COST TO OPERATE AT NEW LOCATION: (_____) [Specify]

Low Middle High

Confidence Level

GAME CHARACTERIZATION
PLAYERS

#121. Player Selection. #121-5 "Proprietary interest advocates" refers to the use of players who have a personal interest in the actual use of the game or in the use of the results of the game for some specific purpose. For example, a proprietary interest advocate might be a group of individuals either advocates for or opponents against a weapons system, such as MIRV, or the SST, or a specific place of hardware. The game may be used as part of an ongoing advocacy process. In cases such as this, it is extremely important to sort out players whose play surrounds the environment of the game from players whose interests cease with the use of the game for whatever its explicit stated purposes.

121-0 PLAYER SELECTION: UNKNOWN
121-1 PLAYER SELECTION: UNPAID INDIVIDUAL VOLUNTEER
121-2 PLAYER SELECTION: VOLUNTARY GROUP
121-3 PLAYER SELECTION: PAID VOLUNTEER
121-4 PLAYER SELECTION: COURSE REQUIREMENT
121-5 PLAYER SELECTION: "PROPRIETARY INTEREST ADVOCATES"

Low Middle High

Confidence Level

#122. Player Characterization: Post graduate refers to individuals at a war college or other academic institution. #122-3 Professional refers to in the sense of the game being played. A military man playing a war game would be regarded as a professional. If he were playing a business game, he would not, in general, be regarded as a professional.

122-0 PLAYER CHARACTERIZATION: UNKNOWN
122-1 PLAYER CHARACTERIZATION: POST GRADUATE
122-2 PLAYER CHARACTERIZATION: ADULT (NON PROFESSIONAL)
122-3 PLAYER CHARACTERIZATION: PROFESSIONAL
122-4 PLAYER CHARACTERIZATION: OTHER

Low Middle High

Confidence Level

#123. Player Use. In some man-machine exercises live players are used only because they are cheaper or more readily available than a simulated player. There is no attempt to train them nor are their goals of particular concern to the exercise. In this sense they are merely a substitute for machinery; this possibility is described in #123-0.

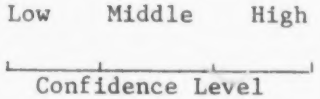
123-0 PLAYER USE: ONLY AS "MACHINERY"
123-1 PLAYER USE: AS PLAYERS

[IF ANSWER TO #123 IS #123-0 SKIP THE REMAINING QUESTIONS ON PLAYERS AND START ON "GAME USE" QUESTIONS]

124-0 PLAYER PAYOFFS: UNKNOWN
124-1 PLAYER PAYOFFS: MONEY WAGE
124-2 PLAYER PAYOFFS: GRADES OR PAYMENT
124-3 PLAYER PAYOFFS: FIXED PRIZE
124-4 PLAYER PAYOFFS: PRIZE PROPORTIONAL TO PERFORMANCE
124-5 PLAYER PAYOFFS: "EDUCATION"
124-6 PLAYER PAYOFFS: NOT SPECIFIED

#125. Player Pretest Comprehension Test: Is a check made to see if the players fully comprehend the game prior to play? This includes the use of a practice play followed by questions.

125-0 PLAYER PRETEST COMPREHENSION TEST: UNKNOWN
125-1 PLAYER PRETEST COMPREHENSION TEST: NO
125-2 PLAYER PRETEST COMPREHENSION TEST: YES

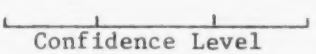


#126. Player Pretest: #126-1 Refers to the case where no particular pretesting after the selection of the players has been performed; #126-2 refers to games in which one has in fact run pretests on the players. This may be a California Personality Inventory, it may be IQ-tests, and so forth. One runs subjects or players through a barrage of tests outside of the formal game.

Player pretest could be a test for IQ, general knowledge, etc., or some sort of personality test. It does not necessarily imply a comprehension test for the game.

126-0 PLAYER PRETEST: UNKNOWN
126-1 PLAYER PRETEST: NO
126-2 PLAYER PRETEST: YES (_____)[Describe]

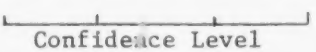
Low Middle High



Confidence Level

127-0 PLAYER POST PLAY COMPREHENSION CHECK: NA;UNKNOWN
127-1 PLAYER POST PLAY COMPREHENSION CHECK: NO
127-2 PLAYER POST PLAY COMPREHENSION CHECK: YES

Low Middle High



Confidence Level

#128. Player Perception of Success of Purpose: In this characterization we are not asking the question as to whether the game was effective, but as to how the experience was perceived by the players. A good question that must be asked of all games is, "How does enjoyment correlate with the value of a game?" It is conjectured by us that up to a certain level there is probably a positive correlation between the effectiveness of a game and the level of enjoyment or enthusiasm. Beyond a certain level, however, we suspect that the correlation weakens or goes negative. A highly enjoyable game may in fact have been enjoyed as a game and not as an operational, research, or teaching device. Informally we have observed that apparently there is not a great amount of correlation between highly popular lecturing, acting performances, and the amount of information that is conveyed to the students. In some cases player reaction may be mixed. You may wish to give a percentage breakdown next to the categories or draw a small graph.

128-0 PLAYER PERCEPTION OF SUCCESS OF PURPOSE: NOT RELEVANT; UNKNOWN
128-1 PLAYER PERCEPTION OF SUCCESS OF PURPOSE: HIGHLY POSITIVE
128-2 PLAYER PERCEPTION OF SUCCESS OF PURPOSE: POSITIVE
128-3 PLAYER PERCEPTION OF SUCCESS OF PURPOSE: NEUTRAL
128-4 PLAYER PERCEPTION OF SUCCESS OF PURPOSE: NEGATIVE
128-5 PLAYER PERCEPTION OF SUCCESS OF PURPOSE: HIGHLY NEGATIVE

Low Middle High

Confidence Level

129-0 "AVERAGE" PLAYER'S ENJOYMENT: NOT RELEVANT; UNKNOWN
129-1 "AVERAGE" PLAYER'S ENJOYMENT: HIGHLY POSITIVE
129-2 "AVERAGE" PLAYER'S ENJOYMENT: POSITIVE
129-3 "AVERAGE" PLAYER'S ENJOYMENT: NEUTRAL
129-4 "AVERAGE" PLAYER'S ENJOYMENT: NEGATIVE
129-5 "AVERAGE" PLAYER'S ENJOYMENT: HIGHLY NEGATIVE

#130. Number of Players Per Team: Do not fill in more than the three most frequently used categories.

130-0 NUMBER OF PLAYERS PER TEAM: (_____)[Specify]

Low Middle High

Confidence Level

131-0 REPEATED USE OF PLAYERS: NA;UNKNOWN
131-1 REPEATED USE OF PLAYERS: NO
131-2 REPEATED USE OF PLAYERS: YES

Low Middle High

Confidence Level

#132. Role Playing (Individual): #132-1 Role playing: self is the category which indicates that no other role playing is required of the players in the particular game. #132-3 Role playing: specific person implies for example that somebody play Stalin or Mao Tse-tung or Mr. Nixon. #132-4 and #132-5 A specific organization might be something like General Electric; an abstract organization would be a large business firm.

132-0 ROLE PLAYING (INDIVIDUAL): NOT RELEVANT/UNKNOWN
132-1 ROLE PLAYING (INDIVIDUAL): SELF
132-2 ROLE PLAYING (INDIVIDUAL): SPECIFIC POSITION
132-3 ROLE PLAYING (INDIVIDUAL): SPECIFIC PERSON
132-4 ROLE PLAYING (INDIVIDUAL): SPECIFIC ORGANIZATION/INSTITUTION
132-5 ROLE PLAYING (INDIVIDUAL): ABSTRACT ORGANIZATION/INSTITUTION

Low Middle High

Confidence Level

133-0 ROLE PLAYING (TEAM): NOT RELEVANT/UNKNOWN
133-1 ROLE PLAYING (TEAM): SELF
133-2 ROLE PLAYING (TEAM): SPECIFIC ORGANIZATION
133-3 ROLE PLAYING (TEAM): ABSTRACT ORGANIZATION
133-4 ROLE PLAYING (TEAM): SPECIFIC INSTITUTION
133-5 ROLE PLAYING (TEAM): ABSTRACT INSTITUIION

Low Middle High

Confidence Level

#134. Importance of Unstated Purposes: This question involves the characterization of players and what might be described as "the game outside of the game." For example, in the case of a business game where many executives from the same firm play unaccustomed roles in a simulated hierarchy, there may be pressures exerted on the individuals as a result of their being aware that they are being watched. Even in experimental games, the players sometimes may decide to play "fool the experimenter" or "give him what he wants." This question is admittedly subjective, but it merits serious consideration.

134-0 IMPORTANCE OF UNSTATED PURPOSES: NA
134-1 IMPORTANCE OF UNSTATED PURPOSES: HIGH
134-2 IMPORTANCE OF UNSTATED PURPOSES: SOMEWHAT
134-3 IMPORTANCE OF UNSTATED PURPOSES: SLIGHT
134-4 IMPORTANCE OF UNSTATED PURPOSES: NONE

Low Middle High

Comments or Discussion:

Confidence Level

#135. Game Users: Count the number of institutions where a game, simulation, or a direct variant is being used. This may tend to produce some overestimation, yet for most purposes this is the most relevant figure. It gives an insight into how widespread the direct use of a game has been or how widespread the influence of a game has been.

135-0 GAME USERS: (_____)[Specify]

Low Middle High

Confidence Level

PART IV

VOLUNTARY ASSESSMENT

For the remaining questions assume that a senior professional (one who really knows the business) wishes to use this MSG and wants your evaluation along several dimensions.

#136. Assessment - Design and Construction: What are the strengths and weaknesses of this MSG's design and construction?

Comment:

#137. Assessment - Planning Factors and Data: What in your opinion are the strengths, weaknesses, and constraining features of the data used in the MSG? How serious are the deficiencies or weaknesses, if any?

Comment:

#138. Assessment - Documentation: How complete and useful is the supporting documentation? Would it be easy for some other agency to use the MSG, or would the extent and quality of documentation make this difficult or impossible?

Comment:

#139. Assessment - Operation: Are there peculiarities of operation that a prospective user should be aware of? Is the MSG easy to operate or are there unique procedural problems that one should know about?

Comment:

[For Man-Machine or Manual Games Only.]

#140. Assessment - Post Debriefing Analysis: Are the MSG's outputs easy to analyze or are they intended for use in subsequent analyses?

Comment:

#141. Assessment - Cost Effective: Do you think that the MSG represents a cost-effective way to get at the issues it addresses, or would you recommend alternative procedures, methods or techniques?

Comment:

#142. Assessment - Validation Criteria: What questions related to validation have been posed and are they clear and concise or are they vague, confusing or non-existent? Has much attention been given to validation of the MSG?

Comment:

#143. Assessment - Validation: Based on the criteria that were developed, was any validation done on the MSG? What resulted?

Comment:

#144. Assessment - Overall: In your opinion is the MSG of outstanding, average, poor, or of indeterminate quality? Would you commend it for future use? Unqualified acceptance? Qualified?

Comment: